Design Course

Form

Shape of the Things

by
Prof. B. K. Chakravarthy
IDC, IIT Bombay

Source:
https://www.dsource.in/course/form

1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

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5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Introduction

Form is the shape, visual appearance or configuration of an object. The form of an object is the first interface that we perceive. Form gives meaning to an object. It provides an interpretation to the function of the object. It can arouse and fulfill desires. It shapes human interaction with the object.

Designers create forms by deliberately shaping data into information and then into the coherent argument that is the product. This argument is, according to Richard Buchanan, its "ability...to fully engage a human being in support of a particular activity."

Form should not be thought of as simply the physical or aesthetic properties of a product. It rather includes all aspects of an object's character and the values of the culture to which it belongs. Form is the manifestation of the object's usefulness, usability and desirability.

According to Philip Meggs, form gives a design its cohesive composition that gains order and clarity from the relationship between the elements.

Aim of the Course:
The course aims to first introduce students to design in nature and everyday life. Thereafter presentations were made on what can be called as characteristics of a good design. Further presentations explain how to generate emotive form and how to generate forms through abstractions. Studio assignments were given to the students through which they gained hands-on experience in form generation using these techniques.

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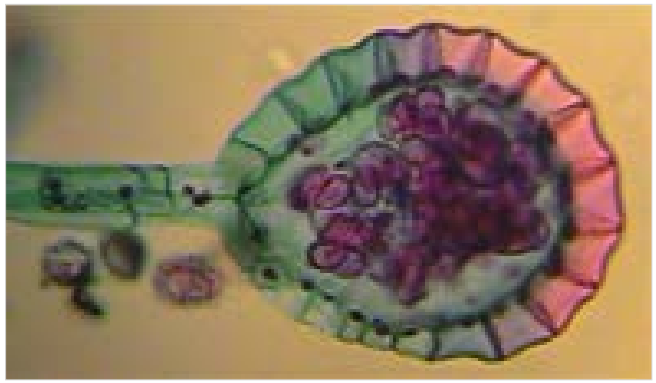
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Design and Nature

1. Design and Nature:
Design is implicit in nature in even its simplest forms. People are conscious of the beauty of a flower, a leaf, or a seashell, the wonderful world of the microscope is frequently familiar only to the scientist.



Through magnifications we discover the most fundamental truths about design and many of the most fascinating patterns and space relationships existing everywhere.

Fern Sporangium, when viewed through a microscope, reveals its circular motif.

2. Rhythm:

Any good design is based on some sort of rhythm, and the realization that not only the animal kingdom but also the plant and mineral world ebb and flow in a constant yet flexible rhythmic pattern.

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

2.1 Seasonal and Lunar Rhythm:

We take for granted the rhythm of the seasons. The pattern of life has revolved around an eternally recurring cycle of spring festivals celebrating the sowing of seeds, harvest celebrations in honor of the reaping and storing of crops, and winter festivals to relieve the long monotony of the barren months. The rhythm of seasonal change is apparent in landscape and weather.

Seasonal Rhythm:

Scientists have made detailed studies relating migratory patterns of birds with the weather, to the presence of insects and other food in certain areas, and to breeding habits. The routes and destinations are definite and unvarying for the most part, related to the changing seasons. Some birds like geese and some ducks need some cold snowy weather to let them know it's time to go.

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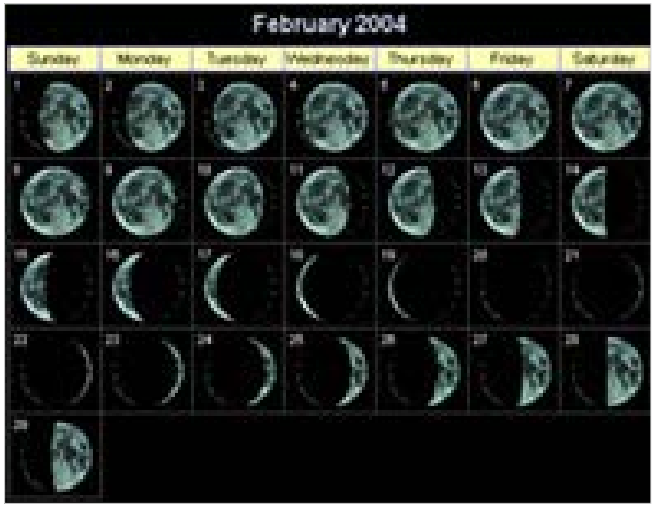
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Lunar Rhythm:



The relation of moon and tides has long led to theories about the effects of the moon upon human events. It's quite possible that much of the folklore may have valid bases stemming from the close associations of primitive people with nature and their observation of and dependence upon cycles that tend to go unobserved in mechanized modern life.

Daily Rhythm:

The rhythms of night and day have varying manifestations. When a bean plant is raised in darkness, it has no daily sleep movement in its leaves; but of exposed to a flash of light, it will show a definite natural reaction. When it is returned to darkness, the pattern remains; every day at the time of that single exposure to light the leaves will persist in elevating.

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The fiddler crab starts to turn black at sunrise, wearing a protective cloak against the glaring sun and predators. At sunset it speedily blanches out again to a silvery grey. Even captured crabs, when kept in a dark room, will continue to exhibit this natural rhythm.

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3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Many animals emerge towards evening to seek water and food or, in the case of the beaver, to work on their dams and lodges. Some of these patterns are conditioned by the presence of man or traffic during the day. Even in isolated regions a natural rhythmic pattern can be detected among various species.

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3. Design and Life
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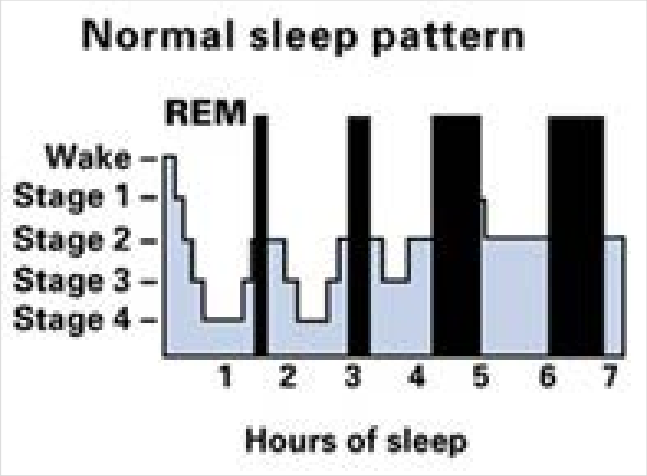
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

2.2 Man and Rhythm:



From his first heart beat, man is a creature of cycles – of the rhythmic contraction of the heart known as systole and diastole, of the beats of his pulse, of the regularity of breathing, of waking and sleeping, of eating and fulfillment, of activity and rest. His reproductive processes follow set patterns of fertility and sterility and his gestation period forms a precise design of development that can be clearly charted from month to month.

Primitive man's first expressions were his beating on a simple drum of animal skins, dancing to this beat, and chanting in monotonous rhythms.

African traditional drum beating.

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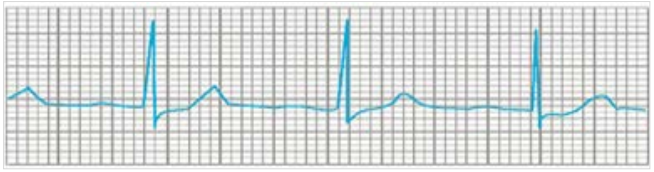
7. Contact Details

Gradually the structure became more complex, with narrations of events evolving into dramatic enchantments and with new instruments added to accompany the drums.

Modern Brazilian drum beating.



Graphic expression follows much the same patterns. The Electrocardiogram presents a definite relationship of natural rhythms to graphic representation. These are rhythms made unconsciously by man, designs based on the rhythms inherent in human life.

3. Variety:

The existence of rhythm ensures variety, for it is the contrast of light with dark, of winter with summer, of height with depth, and of loud with a soft beat that makes for the rhythmic pattern. The green tree is enhanced by the tracery of black branches through its leaves. The variations in flowers, rocks, seashells and butterflies have caused people to travel the world over in search of specimens.

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

3.1 Variety in Shape and Size:

The most obvious variations found in nature are those in size and shape. In an area so small that it might well go unnoticed; the Japanese create an atmosphere of tranquil beauty. The Japanese landscape designer ensures that his surroundings are designed to look uncultivated and natural thereby achieving unity with nature – the essence of good design.

Dramatic variations among trees can also be noted. A field of daisies is interesting owing to a wide variation in scale, from tiny flowers half hidden in the grass to the largest ones with their prominent button centers. No area of grass between the clumps of flowers is of the same size and shapes as any other area.

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

In astronomy, one finds similar variety of size and spacing. Although at a distance many stars may seem alike in size, the aspect of the heavens as a whole is one of infinite variety in distribution and brilliance.

3.2 Variety in Color:

The best way to appreciate variation in color is to attempt painting a landscape. One may discover the infinite variety and subtlety of nature's greens; not only the differences between the green of leaves or grass but of various areas within the leaves and grass, where a ray of sunlight brightens or a cloud shadow makes the green darker and cooler.

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3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

The sky offers another pitfall, for there is no surer sign of an amateur painter than the garish blue of the sky he paints. To produce a sky with the convincing look of nature requires great subtlety and a willingness to see that what one may conventionally think of as blue is often green or rose. While color in nature is all round us, there is much that is hidden from us – not by outward circumstance but by own blindness and preconceptions.

3.3 Variety in texture:

The exploration of texture is one of the major adventures in the artist's study of nature. Texture has two dimensions: tactile quality and visual quality. The tactile quality can be felt and appreciated with the fingers, like the ridges on the leaf shown in the image here. In design the tactile quality often comes from the nature of the material used, such as the roughness of a stoneware jar or the nubbiness of a tweed fabric, and a good designer takes his textural effects from the material itself.

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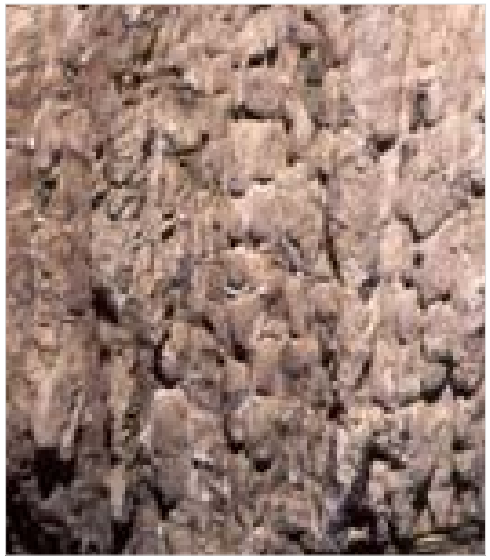
6. Form and Abstraction
7. Contact Details



Weathering is a great creator of texture in nature. Sometimes in the case of stones, old stumps, or metal, visual textures created by the elements remain after tactile textures have disappeared under the polishing action of the wind, rain, sun and snow. Spheroidal weathering of sandstone at Mt. Vesuvius.

Leaves attacked by insects develop fascinating patterns as their cells disintegrate.

Feeding pattern of a caterpillar.

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5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

4. Balance:
Variations in size and shape, and in texture provide esthetic balance to the natural environment. The presence of bright color as an accent in the stretches of green field, forest, and the blue sky is nature's way of counteracting great cool areas with small bits of exciting colors. This is balance.

Examples of Nature's balance:
• The rough bark of a tree is balanced by the smoothness of its leaves.
• Smaller flowers frequently have the greatest fragrance.
• The porcupine has his protective quills, and the skunk his offensive odor, and tiny insects have a potent sting to compensate for their lack of size and ferocity.
• In human life, after every inhalation, comes exhalation; days of activity are followed by nights of rest.

5. Form:
The world around us is composed of forms, each with individual characteristics. Trees, which from a distance look flat, when approached become three-dimensional forms that can be walked around and viewed from all sides. The contour of the land is a flattened shape at sunset from behind, but as one moves across it, he finds himself surrounded by hills and hollows, that is, by forms. Even a blade of grass has form when it is handled or blown through to make a sound. Nature embodies all her animal life in form, from man to the so-called "shapeless" jellyfish. Form is involved with mass or volume, but it goes further. Mass or volume is delimited by shape and is contained by size, thereby becoming the form of the object.

6. Unity:
Nature, in all its parts, demonstrates a certain fundamental similarity.
• The life rhythms occur in weather, in the seasons, and in man – are all interrelated.
• The rotation of the electrons around the nucleus is similar to the ordered movement of infinite galaxies orbiting the universe.

The cycle of creation and disintegration illustrates the great basic fact of nature, the characteristic overall relationship of elements identified as Unity, or harmony. As physicists and other physical and biological sciences point more and more toward the oneness of the universe, one realizes that this is what philosophers have been trying to convey for centuries.

7. The Creative Artist:
The four principles found in nature and their resulting unity can be valuable guides to the creative artist as he strives to improve or interpret what he finds. This unity of rhythm, variety, balance and form comprises the essence of the universe. Appreciation of this essence and application of the four principles can help the creative artist make a meaningful contribution to the field of design.

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4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Design and Life

The feeling for design is as old as mankind. The materials for design are millions of years older. Design is considered a man-made expression, yet its roots reach back into the beginnings of the earth. Primeval eras manifested Design through the expression of natural laws of growth and formation.

The Understanding of the origins of forms and processes is of inestimable value to the designer. An exploration of the natural rhythms and the ability to see eternal forms, which outlast all man's activities, are a challenge to the designer. The designer will need to see life wholly and contribute to it a sense of purpose.

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4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

2. Characteristics of Design:

The Designer will find no rules or formulas to help him in his search for expression. He will not even find a simple definition for design. Being an expression of man's own reaction or experience, design is as individual as the person who creates it. There are however, certain characteristics that can be associated with any good design.

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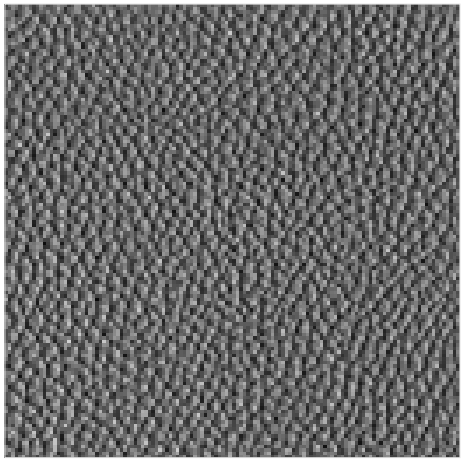
A plan of order



Expression of material

Fulfillment of purpose

Relationship to natural laws of growth and order

Individuality

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
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7. Contact Details

2.1 A Plan of Order:

Order has been the cornerstone of creativity. The world began when order was created from chaos. Confusion or nothingness gave way to form and order, that is, to Design. As man evolved into an intellectual being, his need for order found expression in his habitat.

Habitat: The palace, the temple, the cathedral, the mausoleum, the skyscraper developed from a feeling of design arising from the need to divide the simple cave into areas for dining, sleeping and leisure.

Order, or Design, can in fact be interpreted as the foundation of all living. Any good design is, first of all, a plan for order.

A Combodian Palace.

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A Nepalese Temple Shrine.

A Mausoleum in Chicago.

Shanghai Skyline.

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3. Design and Life
4. Basic Form Studio Assignments
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7. Contact Details

2.2 Expression of the Material:

The earth is an interwoven tapestry of life composed of blocks of field and forest, of plowed ground, of towns and cities. It is the very character of the earth coming to its surface from deep within: the areas of fertility yielding patches of green or gold; the towns and cities, with their deeply rooted networks of pipes, gas and electric lines, railways, marked by a richly textured area of concrete, glass, steel, trees, streets with thousands of people and their perplexities.

Any design should be an expression of its materials, rather than an external attempt at decoration.

A Port Town in Europe

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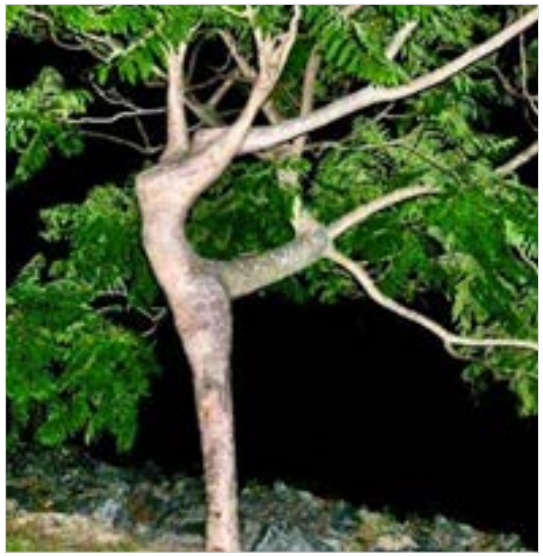
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

A Settlement in England

2.3 Fulfillment of Purpose:



Purpose in nature is usually involved in survival. A tree grows in a certain shape to survive in a constricted area. Fish develops fins so as to move through water, find food and safety from predators. In man's design, purpose is concerned with other levels of activity. An effective design will fulfill its purpose.

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2. Design and Nature
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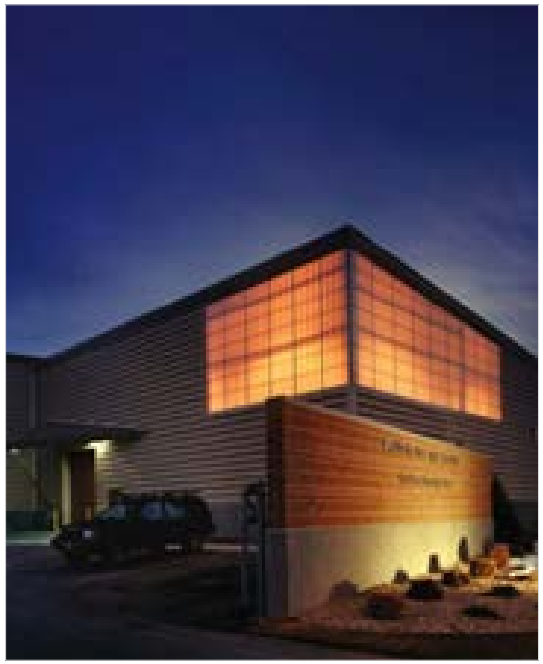
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Fulfilled purpose is exhibited in the totem poles created by Indians of the Pacific Northwest. Stylized characters of exciting variety are carved into the huge poles of the Northwest cedars, adding tremendous drama and meaning to the depiction of the history of the clan. Even the colors have meaning.



One of the most functional uses of design is in the creation of architecture. A well-designed building will have a floor plan, which makes a good two dimensional design on paper. The linear ground plan which shows variety in the layout of the space, harmonious arrangement of sizes and shapes representing rooms, and a pleasing rhythm in the flow of traffic from area to area will, when built, result in a structure that is satisfying and functional in its 3D form.

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3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

In the early 20th century, Frank Lloyd Wright revolutionized architecture with his organic designs springing from their native settings and expressing man's essential needs. Contemporary architecture follows the principles followed by him where shelters are constructed according to the vital requirements of the occupants, with the structure evolving outwards. For integrity of design, buildings should be created for the life within them. The floor plan thus became all-important and the exterior is adapted to it in an attractive and functional way.

Frank Lloyd Wright's Allen-Lambe House above, built in 1915, and it's drawing below.

2.4 Relationship to Natural Laws of Growth and Order:

Nature is the supreme master of inherent design. The smallest granite pebble has its patterns, resulting from centuries of building up and washing away until the round smooth core of design remains, each one unique.

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The trunks of trees are rich in design, drawn in concentric circles through the seasons, then twisted into writhing lines and textures by winds and snows and lightning, hostile elements which serve to improve the tree's own intrepid character. The outer bark has an individual design quality. Each has its own design – a beauty of color, texture, or line that has been part of the tree from its beginning.

There exist eternal laws of growth and order. Each blade of grass unfolds in an orderly way characteristic of its kind. The leaves of every tree and plant evolve in precise sequence. Though growth frequently leads to disorder, the cycle of nature adds quality. Each facet of growth is accomplished according to basic and orderly procedures.

An authentic design is related to the basic natural laws of growth and order.

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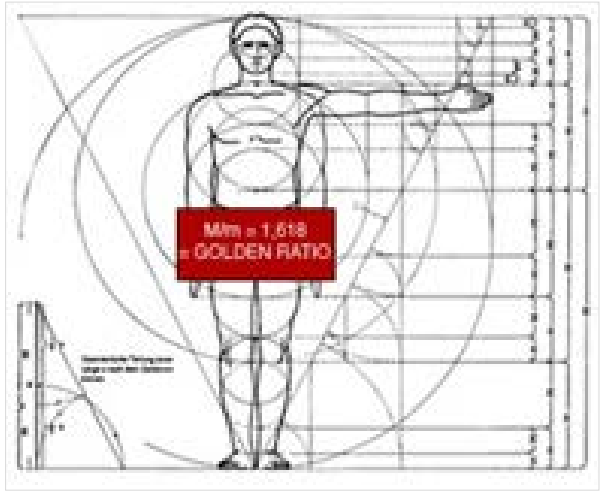
2.5 Individuality:

Snowflakes, though following basic growth patterns, are never exactly alike. Seashells are never identical. The artist who would create truly original dreams must learn to see the individuality of his inspirations and to respect it. One must train the eyes to look beneath the general shape of things to the variation that creates interest. An interesting design has individuality.



It is a fundamental law of science that nothing new is created in the world of matter. Even in design, every design is based on age-old forms, whether these are found in nature or are simple geometric lines and figures used in an abstract way. A talent for design, using elements and methods long grown old, can bring forth freshness and originality in its own inimitable style.

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5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

3. Design and Living:

A creative mind is an orderly mind, a mind that sorts and arranges for creative use:

Whether it is figures, with a statistician;
Whether it is facts, with a historian;
Whether it is theories, with a scientist.
Whether it is melodies, with a composer.

Design is not limited to attractive manifestations. Carefully orchestrated crimes, or military maneuvers are some examples. Many people do not realize that they are unconsciously creating design in the orderly way in which they approach the tasks of everyday life. As life becomes more complex, man's survival is going to depend increasingly upon design.

One of the most basic functions of the designer is the necessity to see life whole and to assign to it a sense of purpose. There are neither rules for creating designs nor any simple definition of design itself. Yet there are certain characteristics, which can be found in any good design.

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3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

4. Characteristics of Effective Design:

- A design is a plan of order.
- A good design is a expression of its material.
- An effective design fulfills its purpose.

An authentic design is related to the basic laws of growth and order. An interesting design has individuality.

'Lota' is an example of very effective design due to the multiplicity of it uses scenarios. The form can be made in a variety of materials.

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by
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https://www.dsource.in/course/form/basic-form-studio-assignments

1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Basic Form Studio Assignments

Various assignments done are mentioned below:

1. Hands as Form Maker:

- Divide in to two or three person teams. Have one person mix a thick plaster solution.
- Pour the solution into the negative area formed by your cupped hand. Let the plaster cure.
- Observe the concave/convex form created by the negative area of the hands.
- Compare your form with those created by your classmates.
- Students concentrate on the form they want to achieve from their hands.
- All forms are in single family because of the patterns formed by the fingers.
- Due to the type of holding, there is variations and hence generate expressions in the form.

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5. Emotive Form Generation
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7. Contact Details

2. Hands as Form Maker within Constraints

Items Needed :

- Balloon
- Long funnel
- Stirrer

Stretch a balloon by pulling and inflating several times. With the help of a partner, insert a funnel into the neck of the balloon, hold the bottom, and pour a plaster solution into the balloon until it is quite full. Tie it off. Develop a concave/ convex form by manipulating the balloon until the plaster cures.

Experiment with several form relationships during the curing period; be sure to have the balloon in its final form when the plaster starts to set. You may also consider multiple forms or nesting forms.

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3. Design and Life
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6. Form and Abstraction
7. Contact Details

Manipulatiethe form to enhance the balloonness and come up with interesting shapes.

All the plaster models exhibit a strong sense of balloonness and at the same time the manipulations with the hands create interesting form transitions.

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3. Learning:
Understanding & creating forms using the balloon as a constraint and how the constraint of the balloon leaves lasting impression on the final plaster model is the basis for all product forms arising from various manufacturing methods.

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
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6. Form and Abstraction
7. Contact Details

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

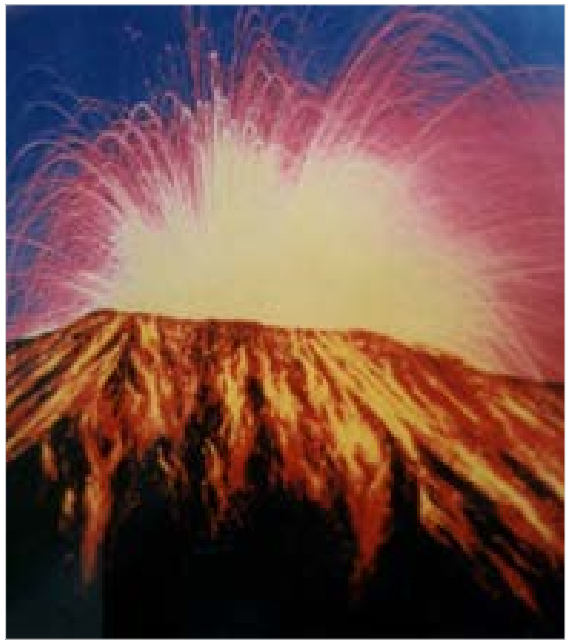
Emotive Form Generation

1. Generating Emotive qualities in Form:
This studio exercise deals in developing a logical process for form generation, using human emotions and objects around us as metaphor for the basic course in product form & aesthetics.

2. Steps Involved in Emotive Form Generation:
- Selection of an emotion
- Collecting visual material depicting the emotion
- Generating visual grammar for the selected visual
- Exploration in clay
- Refinements in rigid PU foam
- Final emotive form

Examples of Emotive Form Generation:

(a) Selected Emotion - Excitement
The visual grammar is drawn from an exploding volcano as listed below:



- The primary element pointing upwards has a sudden break away from the secondary element.
- The secondary element is strong and forms a base.
- The primary element has a sense of dynamism and freedom.
- Both the elements together signify a sense of power.

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3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Exploration in clay:
The feeling for design is as old as mankind. The materials for design are millions of years older. Design is considered a man-made expression, yet its roots reach back into the beginnings of the earth. Primeval eras manifested Design through the expression of natural laws of growth and formation.

Refinement in PU Foam:
Various formal explorations were tried out with a strong firm base and a free flowing dynamic top in clay. PU foam lets create more definite solid forms.

Refinement in PU Foam:
- A firm base – the secondary element
- The kink gives the lift that creates the excitement in the top element – the primary element
- The free flow of the top depicts the flow of excitement through dynamism and freedom
- Both elements together depict excitement

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

(b) Selected Emotion – Joy:

The visual grammar is drawn from the image board below:

Exploration in Clay.

Refinement in PU Foam.

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
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Final Selected form to Depict Joy:

(c) Selected Emotion – Innocence:

The visual grammar is drawn from the image below:

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Refinements in Form:

Final Selected Form:
The soft contours and the large face create the emotion innocence.

(d) Selected Emotion – Affection:
The visual grammar is drawn from the image below:

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Explorations in Clay.

Refinement of Form.

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3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Final Form for Affection:
The soft contours and the enclosing form create the emotion affection.

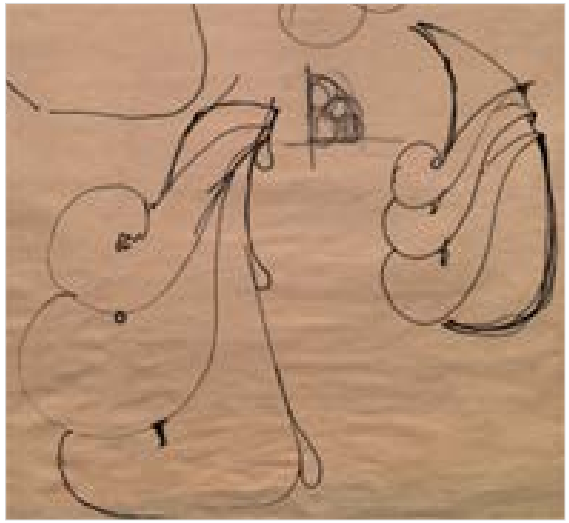
3. Metaphors in Form:

Process for creating forms using metaphors:

- Selection of a relevant metaphor for form exploration
- Concept generation through sketches
- Applying the constraints of material and manufacturing process
- Refinement in 3D with plaster blocks
- Prototyping

Examples:

(a) Water bottle for refrigerator:



Metaphor - Sea waves.

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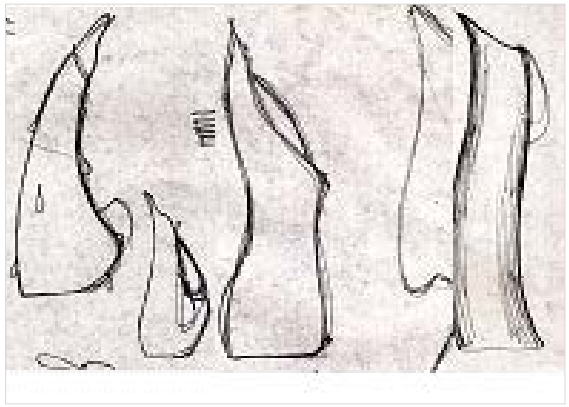

Explorations.

Source:
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Final Water Bottle.

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3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

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2. Design and Nature
3. Design and Life
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5. Emotive Form Generation
6. Form and Abstraction
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(b) Jar for Kitchen Rack:

Metaphor Used – Growth.

4. Inspiration for form generation:

- Inspiration as a creative tool
- Unrelated to the subject
- Visual grammar
- Adapting

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3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
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Examples:

(a) Bus shelter design inspired from bridges and waves:

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5. Emotive Form Generation
6. Form and Abstraction
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(b) Inspired form generation in Helmets:

Ambition

Cricket Spirit

Hip Girl

Passion

Rural

Soft

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(c) Heavy looking Moped for Monto Motors:

(d) Soft look Washing Machine for Electrolux:

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3. Design and Life
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5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

(e) New Semantic Image for Gasoline Dispenser for L&T inspired by Indian classical dance forms:

(f) Inspired by the Mobile Phone Age Advent – Bullet Gasoline Dispenser, MIDCO:

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3. Design and Life
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5. Emotive Form Generation
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7. Contact Details

(g) Image Highlighting the Brand Image and Market Leadership Position of ONGC:

ओएनजीसी
making tomorrow brighter
ONGC
Oil and Natural Gas Corporation Ltd.

(h) ONGC Fuel Station Design Depicting Leadership and Brand Image of ONGC:

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Form and Abstraction

1. Form and Abstraction:
It starts with perception and proceeds with imaginative play.

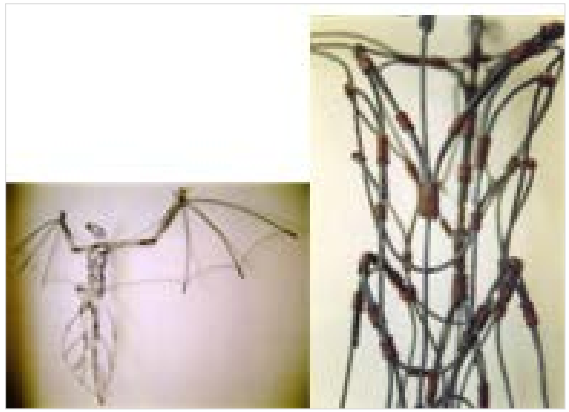
2. Stage I: Introducing Abstraction:
Write a poem on the beauty of your favorite flower.

The task is to relive the experience of a flower in the mind and then entering the imaginative world. Living is experiencing.

Re-experiencing in thinking is re-living. It is a journey of finding a medium, to give form to those thoughts, to share with others and to bring it into this world.

The abstraction will live in concrete language. This requires thinking beyond physical level, experiencing the flower qualities in the mind and converting it into mental qualities.

3. Stage II: Create a flower in its abstraction in wire:



Beauty /Artistic expression, character should come in abstraction.

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1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Wire as a medium has its own opportunities to explore. It just defines the boundary leaving the 3D form open to imagination.

- It's a technique of capturing the essence in the limitation of the medium.
- Peculiarities should be observed and captured.
- Emphasize what you want to say / your statement.

- Observe and utilize 2D and 3D space, and positive and negative space
- Different possible ways to interpret form and shape in wire.
- Transition / flow / relationship

- Explore and analyze the material and process.
- Forms and shapes can be thought of as positive or negative in a two dimensional composition.

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1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

3.1 Stage II: Discussions:
In review discussions, mostly it was stressed that joining details can be further refined. Joints can be used as another lyrical form. This was a potential area of improvement for everyone. Mostly, this form was either ignored or messily dealt with. It was considered as a hindrance to the expression. The material itself has solutions to offer.

The more we experiment the more we unleash our sensitivity to it, and the more it responds to our dialogue. Use of scale could be another area to further look into. The material could spread all over to make an environment. The beauty could be explored in the uninterrupted line of the wire.

4. Stage III: Abstraction, A journey from History to Modern Art:
A presentation was made on the process of abstraction and works of few modern abstract art painters and sculptors.

- Art Nouveau
- Bauhaus
- Seurat
- Cezanne
- Gustav Klimpt
- Brancusi
- Piet Mondrian
- Paul Klee
- Kandinsky
- Van Duesberg
- Picasso
- Marcel Duchamp
- Richard Long
- Jackson Pollock
- Cleas Oldenburg

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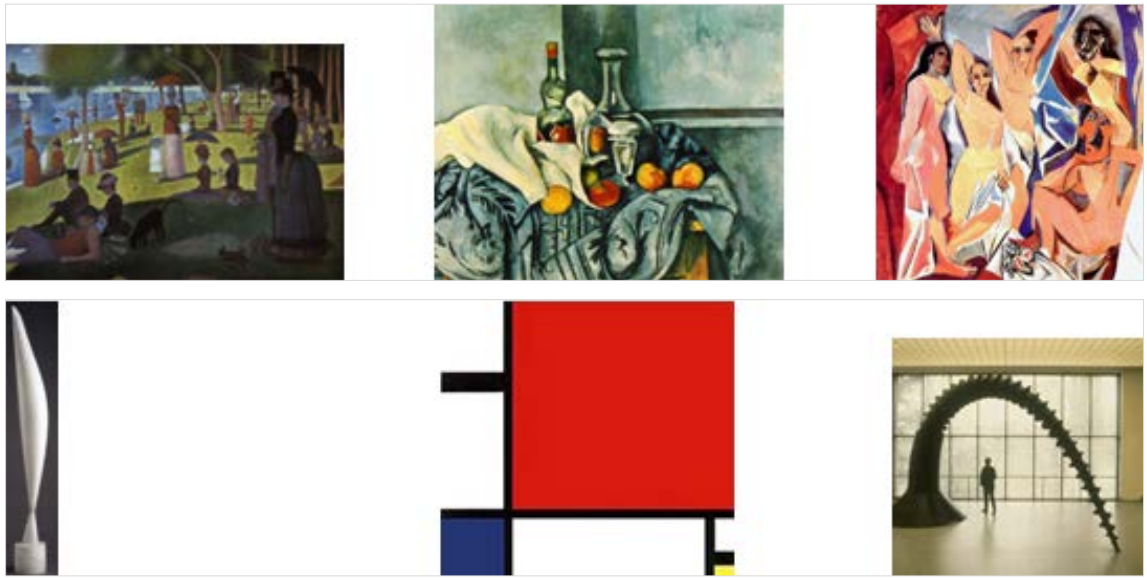
1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details



4.1 Stage IV: Abstraction of chosen Animal, Bird or Insect:

Generic Study:
- General look at the exemplary sculptures
- Abstraction in physical
- Abstraction in emotion
- Excellent direct features
- Should be supported with write-up and questions

Phase 1:
1. Selection of the object for abstraction:
- Choose from Nature:

An animal, bird or an insect - something that inspires.

2. Look biologically, Physiologically:
- Build-up
- Form
- Pattern
- Habitat
- Habits
- Food
- Life-cycle

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1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

3. Look psychologically:
- Behavior
- Grandeur
- Movement
- Link the unseen to the Seen
- Grace, fierceness, laziness, radiance
- Use it as creative exploration to develop sculpture

Examples of Look Psychologically:

Behaviour

Grandeur

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Movement

Grace

Fierce

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1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

• Link the unseen to the seen.

• Use it as creative exploration to develop sculpture.

• Its expression in the art-world, paintings, sculpture, new media, daily-life.
• Use of the subject as motif in advertising, designing.

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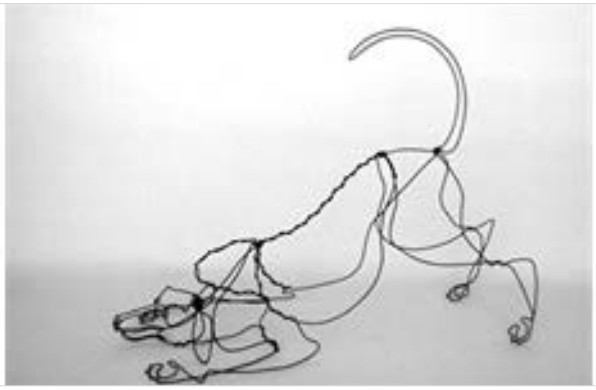
1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

- Re-interpretation in various areas like, tribal art, handicrafts.
- How have other expressions taken shape, with cultural, social and personal influences.
- Minimalism and abstraction with effective use of various medium.

Phase II – Example 1:



- Study the psychology of the chosen animal, insect or bird first. A discovery should come out of the study.
- Expression can be a surprise element.

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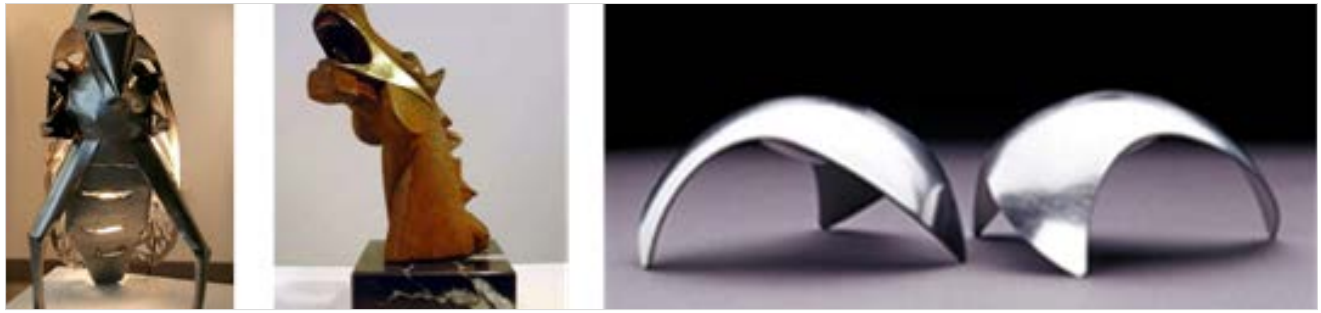
1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

• Explore, experiment, exploit the material. Play with negative and positive spaces effectively

Phase II – Example 2:



• Try to capture the attributes of chosen animal, insect or bird.
• Try to capture the beauty of material as well as form. Capture the form in totality.

• How to relate and integrate the elements is very important.
• Associate to the chosen subject with your own relationship and observation.

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1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Phase II Summary:

An exercise in 'Abstraction' becomes an opportunity to learn the aesthetics of material and processes in a creative framework.

Study of the psychology of the chosen animal, insect or bird helps in discovering some new things about them.

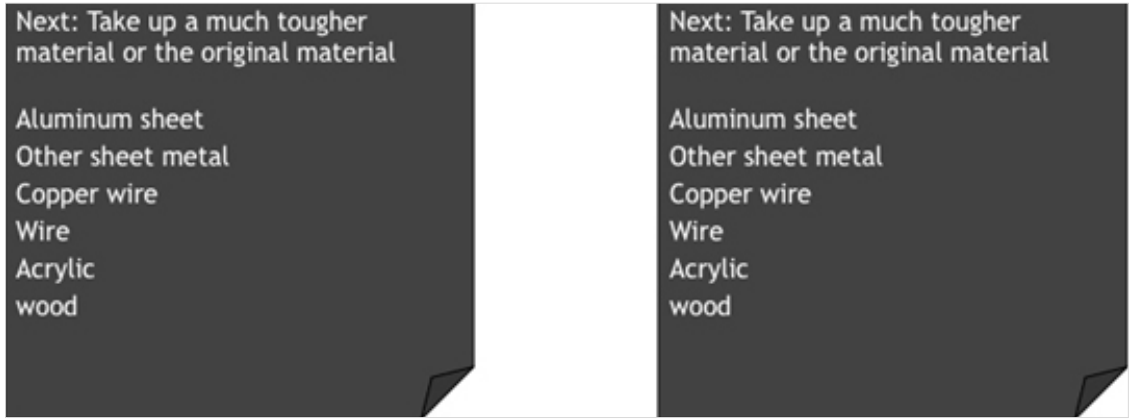
Abstraction can be done tentatively and visually, by gradually and progressively concealing forms drawn from nature. We can create symbolic elements that have no representational origins.

Experiencing of form does not lie in duplication. Reinterpretation is essential, as the medium chosen has its own language and limitations.

Phase III:

Material:

Select material that aids in the physical aspects. Choice of material can also pose as a challenge.



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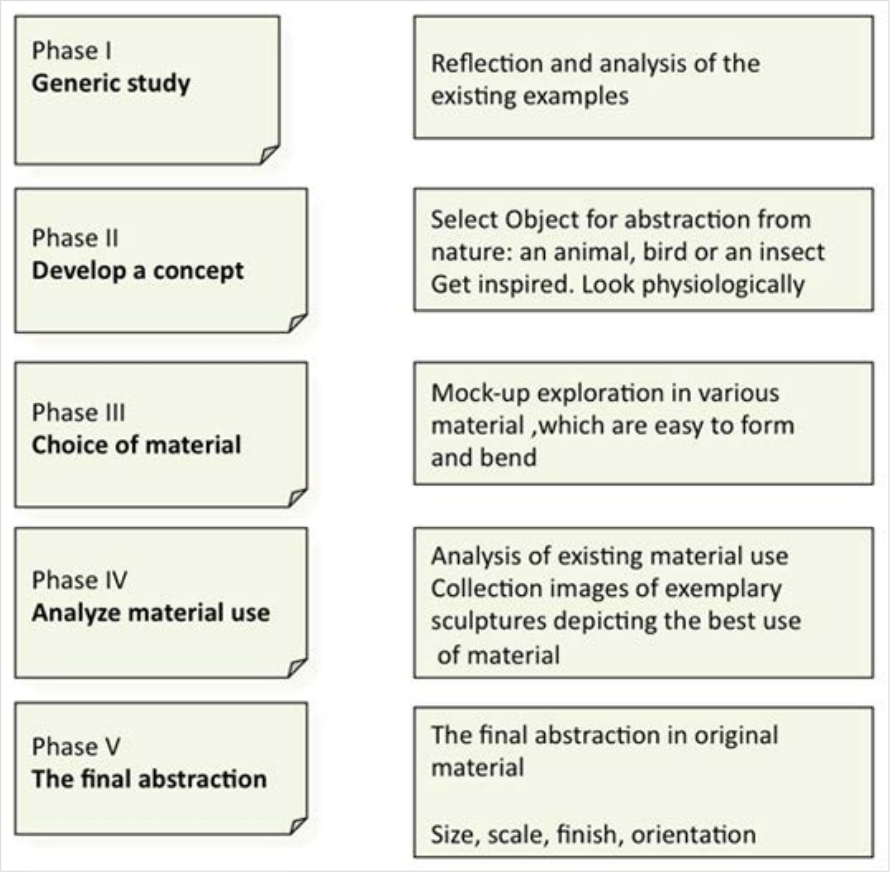
1. Introduction
2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Phase IV:
Collection of images of exemplary sculptures in chosen material. These should depict the best use of material

Make the final abstraction close to:
- Size
- Scale
- Finish
- Orientation

Or a simulation of it in the available material.

Process Methodology:


Phase I
Generic study
Reflection and analysis of the existing examples
Phase II
Develop a concept
Select Object for abstraction from nature: an animal, bird or an insect
Get inspired. Look physiologically
Phase III
Choice of material
Mock-up exploration in various material ,which are easy to form and bend
Phase IV
Analyze material use
Analysis of existing material use
Collection images of exemplary sculptures depicting the best use of material
Phase V
The final abstraction
The final abstraction in original material
Size, scale, finish, orientation

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2. Design and Nature
3. Design and Life
4. Basic Form Studio Assignments
5. Emotive Form Generation
6. Form and Abstraction
7. Contact Details

Contact Details

This documentation for the course was done by Professor B. K. Chakravarthy at IDC, IIT Bombay.

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